

Knowledge and Understanding	Application and Communication	Inquiry
/26	/21	/12

Knowledge and Understanding	/26
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PART 1: Multiple Choice

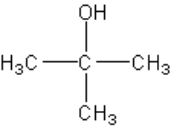
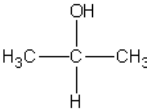
[14 Marks]

- Carbon is able to form large numbers of organic compounds because carbon can
 - form 4 bonds
 - form single, double and triple bonds
 - form chains, rings, spheres and sheets
 - the carbon-carbon bond is very stable
 - all of the above
- From the following list, select the two molecules that are isomers:

1. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$	2. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}(\text{CH}_3)_2$
3. $\text{CH}_3\text{CH}(\text{CH}_2\text{CH}_3)\text{CH}_2\text{CH}_3$	4. $\text{CH}_3\text{CH}_2\text{CH}_2\text{-C}(\text{CH}_3)_2$

 - (1) and (2) only
 - (1) and (3) only
 - (1) and (4) only
 - (2) and (3) only
 - (2) and (4) only
- Which one of the following compounds is not expected to be completely soluble in water at room temperature?
 - $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
 - $\text{CH}_3\text{CO}_2\text{H}$
 - $\text{CH}_3(\text{CH}_2)_{16}\text{CO}_2\text{H}$
 - CH_3OH
- Which compound is most likely to be a gas at room temperature?
 - propane
 - 2-chloropropane
 - propanal
 - propanone
- An amine is characterized by what functional group?
 - $-\text{CO}_2\text{CH}_3$
 - $-\text{NH}_2$
 - $-\text{CO}_2\text{H}$
 - $-\text{CHO}$
 - $-\text{OH}$
- Which of the following is an alcohol?

<ol style="list-style-type: none"> NaOH $\begin{array}{c} \text{OH} \\ \\ \text{H}_3\text{C}-\text{C}=\text{O} \end{array}$ $\text{H}_3\text{C}-\text{NH}_2$ 	<ol style="list-style-type: none"> $\text{CH}_3\text{CH}_2\text{OH}$ $\begin{array}{c} \text{O} \\ \\ \text{H}_3\text{C}-\text{C}-\text{CH}_3 \end{array}$
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- When two alcohols undergo a self condensation, what is formed?
 - liquid alcohol
 - a ketone
 - an ester
 - an aldehyde
 - an ether

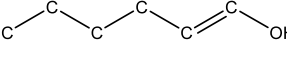
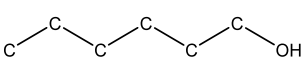
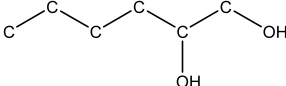
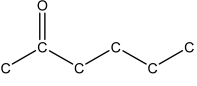
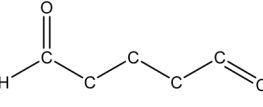
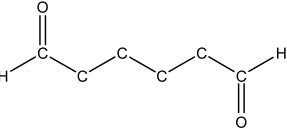
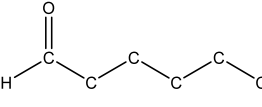
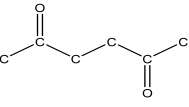
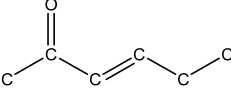
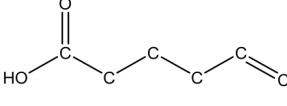
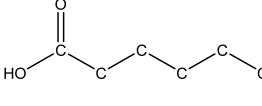
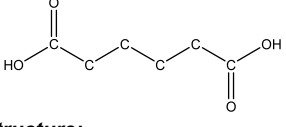
8. Which of the following is a secondary alcohol?
- a.  b. CH_3OH c.  d. $\text{H}_3\text{C}-\text{O}-\text{CH}_3$ e. $\text{CH}_3\text{CH}_2\text{OH}$
9. What results when a secondary alcohol is oxidized?
- a. a ketone d. an acid
b. an amine e. no reaction
c. an aldehyde
10. Which type of reaction will an alkene **not** undergo?
- a. addition d. dehydration
b. polymerization e. hydration
c. oxidation
12. Which of the following classes of organic compounds does **not** contain oxygen?
- a. aldehydes d. ethers
b. amines e. amides
c. amino acids
13. Butane and fluorine gas would react by which of the following?
- a. addition c. substitution
b. combustion d. single displacement
14. Which of the following compounds is a secondary alcohol?
- a. 1-pentanol c. 2-pentanone
b. 2-pentanol d. 2-methyl-2-butanol

PART 2: MATCHING

15. Match each structure provided to the correct name from the list below (**A → L**):

[12 marks]

A. hexanal	D. hexanoic acid	G. 2-hexanone	J. hexandioic acid
B. 1,2-hexandiol	E. 5-hexenal	H. 1-hexanol	K. hexandial
C. 1-hexen-1-ol	F. 2,5-hexandione	I. 5-hexenoic acid	L. 3-hexen-2-one

			
structure: _____	structure: _____	structure: _____	structure: _____
			
structure: _____	structure: _____	structure: _____	structure: _____
			
structure: _____	structure: _____	structure: _____	structure: _____

Application and Communication	/21 Marks
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16. Draw the structures (line-diagram or carbon skeleton) from the names provided: [9 marks]

a).	b).	c).
structure a):	Trans-2-amino-3-methyl-2-pentene	
structure b):	1,4-ethoxycyclopropylbenzene	
structure c):	4-hydroxylbutyl-2-methylpropanoate	

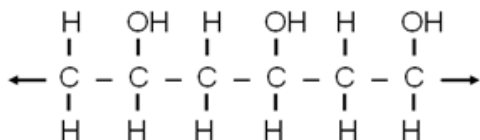
17. Complete the following reactions, by **drawing all reactants**, then **drawing and naming all products**.

[8 marks]

propyne + excess hydrogen bromide →
Benzene + chlorine gas →

18. The polymer PVA is used in hair sprays and styling gels. Draw and name a structural diagram of its monomer(s). (Hint: the monomers exists as tautomers- please draw both).

[3 marks]



Polymer

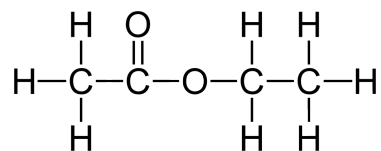
Structure of Monomer 1

Structure of Monomer 2

Names of Monomers:

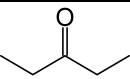


19. Write the reaction showing how the ester below can be prepared from a carboxylic acid and an alcohol. Provide the names of all reactants and any other products, below your equation.

[6 marks]



20. At least one of the following reactions is not possible. Identify the impossible reaction(s) and explain your reasoning:

[6 marks]

	Reaction	Circle One:	Your Reasoning:
1	 + oxidation → product	possible / not possible	
2	 + oxidation → product	possible / not possible	
3	 + oxidation → product	possible / not possible	